X-LASER®

LASER WITHOUT LIMITS™

AURORA 4C AND 4G

PRODUCT MANUAL AND USER GUIDE

For Professional Indoor Use Only - FDA Variance Required

X-Laser strongly recommends keeping this manual with your new laser projector at all times as a field reference.

WARNING
HIGH POWERED LASER DEVICE
BEFORE APPLYING POWER TO THIS DEVICE YOU MUST REVIEW THE CONTENT ON THE USER DVD INCLUDING THE USER MANUAL TO OPERATE THIS DEVICE SAFELY. AN FDA VARIANCE IS REQUIRED PRIOR TO OPERATION OF ANY CLASS IIIB OR IV LASER PROJECTOR.

If you have any questions about any of the content of this manual or the safe operation of your new laser projector, please do not hesitate to contact your dealer or X-Laser directly.

X-LASER USA

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Introduction

Thank you for purchasing an X-Laser product! You now own one of the most powerful and best crafted aerial laser display systems ever created for the mobile entertainment industry.

Before leaving our factory, every projector is carefully checked in a comprehensive quality assurance process to ensure proper and safe operation. In many cases, the quality assurance process is repeated to ensure that the data from the first quality check remains consistent. With this level of attention to detail, you can be sure that your new X-Laser has left our factory in absolutely perfect working order. Please check your laser immediately upon receipt to ensure that it was not damaged in shipping, which can happen with sensitive optical components.

Your new X-Laser projector is capable of producing absolutely stunning aerial laser effects over audiences in nearly any performance application with the convenience and flexibility of DMX control. With the power of X-Laser fixtures also comes a responsibility for safety so we strongly encourage you to read and follow all of the notices throughout this manual.

Please note that this User Guide is NOT exhaustive. For clients in the United States, we strongly recommend that your X-Laser only be used in compliance with the terms of your FDA variance. We also recommend that all of our clients, especially those who may be new to high powered laser, seek advice and further training from experienced laserists and laser safety officers. Truly great laser shows happen when artists really understand the advantages and limitations of their medium. For laser too, the importance of experience in creating powerful, but safe laser displays cannot be understated.

If you have any questions about proper use of your laser system, laser safety, troubleshooting or anything else, visit us on the web 24/7 at www.x-laser.com so that we can best assist you!

Product Labeling

The following label is affixed to the top of your laser projector; if at any point the label becomes illegible, please contact X-Laser for replacement.

X-LASER
9125A Whiskey Bottom Rd
Laurel, MD
XA90815SAMPLE
DATE
August 2015
MODEL
Aurora 4C
Non-Interlocked Housing Warning
CAUTION
Class IIIB laser radiation when open. Avoid eye or skin exposure to direct or scattered radiation
Read all user instructions prior to use.
User variance required prior to operation.
FDA Certified and double quality checked.
For professional indoor use only.
LASER light - Avoid eye or skin exposure to direct or scattered light
CLASS IV LASER Product < 5000mW 402-655nm
Classified per IEC 60825-1 Ed 2, 2007-3
Complies with FDA performance standards except for deviations pursuant to Laser Notice 50 dated June 24 2007 or as described in manufacturer's variance and certification 2007V-0476.
WWW.X-LASER.COM

Caution--use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Safety Notices

1. Do not expose the human eye directly or indirectly to focused or scattered laser radiation as loss of vision, complete blindness, and/or other serious injuries may result. Lasers are capable of starting fires at great distances. Do not use around flammable materials.*

2. This fixture is NOT intended for audience scanning effects. Operators must ensure that the primary laser beam and any reflected beams remain in designated safe areas only. Please refer to the terms of your specific FDA variance for vertical and lateral separation requirements. Commonly, all beams are required to pass no closer than 3m (10ft.) above any surface upon which someone can stand to prevent human access.

3. This unit is intended for indoor use only and should be protected at all times from fluids and humidity. Do not expose this fixture to temperatures outside of a normal working range of 60-90 degrees F.

4. There are NO user serviceable parts inside of the fixture. Opening the outer casing will void the warranty and could result in radiation exposure. Any modifications to the fixture are prohibited, may be dangerous, and will immediately void the factory warranty.**

5. Always ensure that the main power supply is properly grounded before use. Do not use a 2 prong IEC cord with this projector. You should always hook up a laser system in such a way that you have both a primary and backup means of instantly terminating laser emissions.

6. DO NOT USE this fixture if you suspect that it contains a defect of any kind either from manufacturing, damage, general wear or has a broken manufacturer's seal. Return the fixture to the factory for service and/or maintenance immediately.

7. Before using this product in any capacity, ensure that the unit is properly secured to prevent accidental beam shifts and that a safety cable is used for any aerial rigging.

8. This product is not a toy and should be kept inaccessible to unauthorized persons before, during, and after use. Authorized persons

should only be employees of an FDA variance holder. Keep away from minors. **DO NOT EVER allow lasers to enter airspace or hit aircraft**. ***

9. This unit should never be left unattended while operational and should always be unplugged from both DMX and power while being transported, rigged, de-rigged, cleaned, or when a qualified operator is not present. We also recommend keeping your DMX controller separate from the laser at all times to prevent unwanted activation.***

10. Before using this product, it is the responsibility of the user to be familiar with all Federal and State reporting and usage requirements. Laws vary by state. An FDA variance is required to operate this product in the United States. Refer to the included user DVD for more information.

11. Keep all body parts and clothing away from the laser, particularly the aperture mirrors, at ALL times. The mirrors move EXTREMELY fast and will cause serious injury and/or break if touched.

12. Do not stand in front of the laser while active. All persons should wear protective eyewear while rigging, maintaining, or otherwise working with the laser.

*Failure to follow the above precautions and other precautions contained in this user manual, particularly with regard to human exposure to laser radiation and electrical safety, may result in serious injury, loss of vision, electric shock, skin damage, and death. Please refer to the section on safe laser projector usage later in this manual for more detailed operation guidelines. Always be mindful that Class 3B and 4 lasers shoot potentially hazardous radiation at the speed of light. They should be handled and operated with care and caution.

**Any service and/or maintenance to the fixtures is to be performed by factory authorized technicians only, except as specifically described in this manual.

***This product should NOT be operated by persons who are not trained in proper laser safety procedures and/or do not know how to use all components of a laser system properly.

Unpacking Your Laser Projector

Your new X-Laser Aurora laser projector box should contain the following items:

1) X-Laser Aurora laser projector

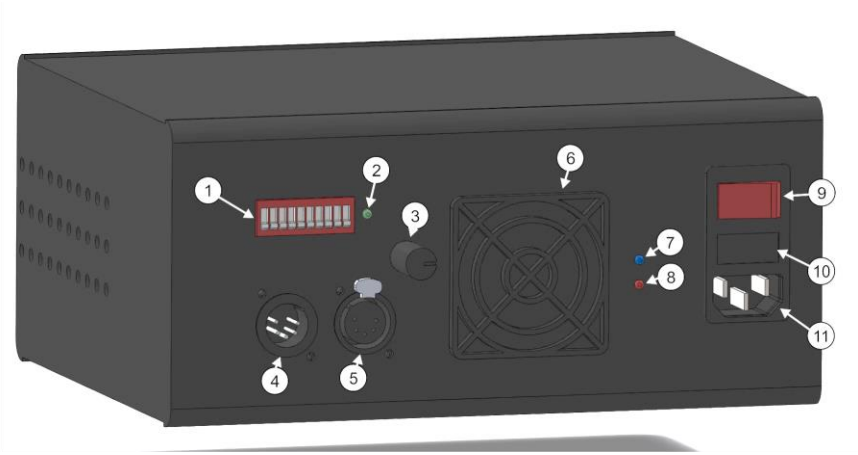
2) A grounded power cable

3) This user manual

4) “Black wrap” beam blocking foil

6) A DVD containing letters, forms, and a wealth of other information about this product and laser safety in general

Projector Layout and Functions



1. DIP Switches
2. DMX signal receive LED
3. Sound active mode sensitivity adjustment
4. 3 pin DMX input
5. 3 pin DMX output
6. Replaceable fan filter
7. Sound level LED
8. Power on indicator LED
9. Main power switch
10. Replaceable fuse
11. Mains power input

Projector Specifications

Dimensions: 21.75" x 8.5" x 6"

Weight: 9.2lbs

Housing: Black Anodized 6061 Aluminum

Power: 110/220V auto switching, 3 pin male IEC inlet

40 watts typical, 60 watts peak

3A 250V Slow blow fuse

Scanners: Open loop micro stepper motors

Cooling: Forced air/TEC

Control options: Auto, Sound Active, 9 channel DMX

Settings interface: DIP switches

Ambient conditions: 60-90 degrees F, <70% relative humidity

Color Modulation: TTL

Nominal divergence: 1-2.5mRad

Beam source: DPSS/Direct diode

Laser power levels:

4C - 50mW 532nm, 100mW 650nm, 100mW 445nm, 100mW 650nm/100mW 445nm

4G – 50mW 532nm x 4

FDA Hazard Class: 3B

Power Variations

X-Lasers are hand built laser light show products produced from scratch and built to order. Because lasers are made with such small power levels, variances from fixture to fixture do and will exist. This can be influenced by a dozen factors from temperature and diode age to normal voltage fluctuations and initial cold start power. We make all lasers within very small (<10%) tolerances but under some conditions differences can be noticeable. If you require precisely matched diodes please contact your dealer and request a power match before ordering as variances within tolerance are not considered a defect.

General Guidelines for Safe Laser Use

Your X-Laser product is a powerful laser device intended for aerial indoor lighting displays operated by professionals. The major concern with professional laser systems is to avoid human contact with the laser beam and to create a safe area where patrons and staff can enjoy your light show. Please observe the following guidelines when using your X-Laser product:

1. For all venues you must designate restricted areas of the venue where persons are not allowed to be. These restricted areas, which may include the space above a dance floor for overhead beam shows, should be the ONLY places that direct or reflected beams should be allowed to enter and terminate. The goal, in all cases, is to avoid ANY human contact with the laser beams.

2. As a laser light show operator you have a responsibility to reasonably foresee circumstances where conditions could present a safety risk to people. This means that you must make sure all laser units are properly aimed via your show programming, physically blocked to prevent radiation spill or reflection into safe areas, and securely mounted. Also, to be sure that these conditions are met properly, trained employees should be the only ones rigging or operating X-Laser products.

3. Because the AUTO and SOUND ACTIVE modes of the laser do not allow for manual scanning control, this unit should ONLY ever be operated in DMX mode in show conditions. You must use the X axis controls built into the DMX protocols to confine the laser to the restricted areas of your venue only.

4. Because there are no user serviceable parts inside of X-Laser products, the outer case should never be opened by the user. To ensure proper safe operation in demonstrations and performances, please immediately discontinue use of your X-Laser product if you notice or suspect that any part of the laser is not functioning properly. In such a case, call X-Laser or your dealer for an RMA number and we will repair the unit to bring it back into compliance.

5. As a reminder for clients in the United States, Class 3B and 4 laser products may only be used by a person or employees of an organization which holds a Laser Light Show Variance. All such persons must have adequate and appropriate laser operation and safety training, keep a copy of their variance with them at all performances, and keep appropriate safety logs and checklists. The variance holder must also file annual reports as required by the CDRH (FDA) and ensure that their variance is renewed prior to expiration. Copies of these forms, introductory training materials, and more may be found on the DVD enclosed with this product.

6. We strongly recommend that each user of an X-Laser product read "Safe Laser Display" literature published as ANSI Z136.1 and Z136.10. These and a wealth of laser safety information are available from www.rli.com and the Laser Institute of America. We also strongly recommend that proper safety equipment such as wavelength specific laser safety glasses be used during any times in which a technician or others could be exposed to laser radiation.

7. Excellent laser training is available from a number of private institutions such as RLI above and we recommend that all of our users undertake it. Basic safety training is provided with this product but is NOT meant to be comprehensive. Please follow the enclosed instructions on the user DVD.

8. Do not ever, under any circumstances, allow laser beams to enter airspace without approval from the FAA or any other applicable authorities. Striking an aircraft with a laser beam, even if accidental, is very dangerous and is a felony punishable by fines and jail time.

We want you to have a wonderful experience with our products so that you can bring the thrill of professional laser light shows to your audiences. The safety procedures outlined in this manual should be easy to successfully implement in your shows and provide you with years of safe and profitable laser displays. Please contact us if you have any questions about how to safely and effectively use our products!

General Guidelines for Proper Usage

1. Always treat your laser with great care as some components are very fragile. This is not a standard “DJ” light that can bounce around in the back of a van for years and work just fine. Care for it as you would an intelligent mirror scanner or laptop.

2. Aurora series X-Lasers are designed to work well with standard DJ/club DMX lighting controllers. Controllers such as Grand MAs and similar consoles which output faster DMX, may not be able to control this laser.

3. Always keep all factory supplied labels on the unit and visible. They are all required for legal compliance.

4. The unit is supplied with black wrap foil to be used as beam blocks to prevent the laser from accidentally scanning into the audience area. These are provided separate from the fixture so that they can be applied, adjusted, and removed easily for mobile entertainment applications.

If this unit is to be permanently installed, you may permanently apply the foil to the outside of the unit. To apply, simply use thin strips of gaffer’s tape or a heat safe glue for permanent installation. Using this foil is required for maximum safety and we recommend replacing the foil and/or tape at the first signs of wear. Replacement foil strips can be obtained very inexpensively through your X-Laser dealer.

5. During any use of your X-Laser product be sure to leave open space around all sides of the laser to facilitate airflow through the unit. Do not obstruct the holes in the housing as these permit air to enter and cycle though the unit.

6. Lasers work best at room temperature, with colder and warmer temperatures resulting in inconsistent performance. Always ensure that the laser housing has excellent airflow around the case and that the air is no colder than 60 degrees F and no warmer than 90 degrees F. Failure to do so may result in weak output or overly strong output (this is also a safety issue!) which will diminish the life of the projector. Such failures are NOT covered under our manufacturer’s warranty. Extreme cold or

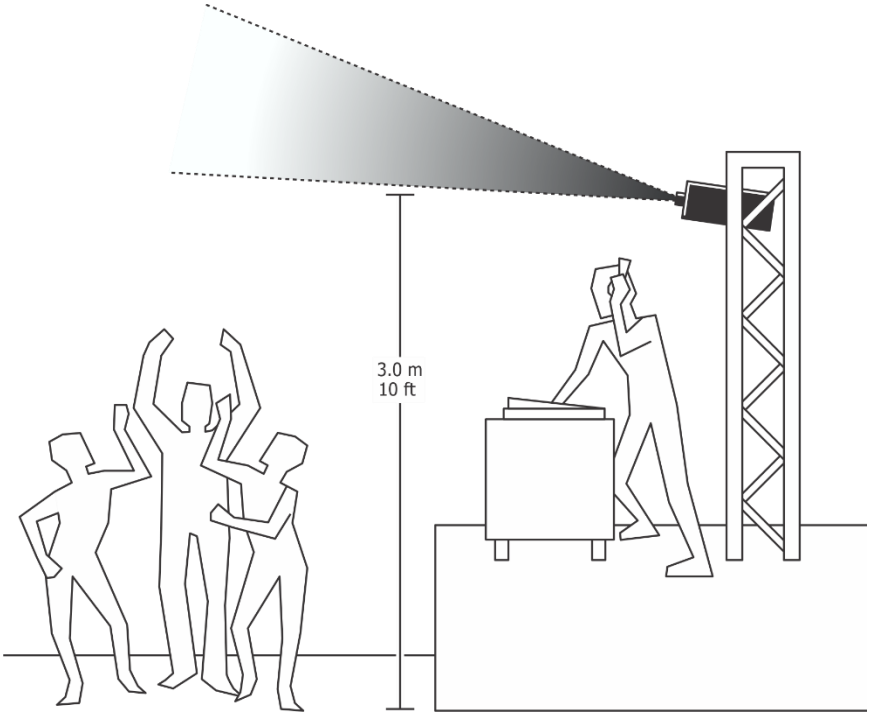
hot temperatures WILL cause a diode failure. Keep this unit climate controlled at ALL times.

Installation

Using the safety requirements previously addressed in this manual and included on the user DVD as a preliminary but not exhaustive guide, you may hang or otherwise mount your new X-Laser product in any suitable orientation. The writing on the sides or front of the fixture should always be right side up or at no more than a 90 degree angle to level. Use great care if you change the orientation of your laser from show to show to make sure that your programming and beam blocks are suitable for the new orientation and will result in safe operation.

Safe Beam and Projection Height

According to most US variances, laser beams must be at least 3 meters (10 feet) above any surface upon which your audience can stand. Refer to your variance for required vertical and lateral safety distances. Performers and trained personal MAY be exempt from these safety distances at the discretion of an experienced Laser Safety Officer who may be able to implement an alternative radiation safety plan.



Example of a safe projection, 3 meters above the dance floor

Operation

Before Powering up Your Projector

Laser beams may shoot in unexpected places during setup so be sure that all areas which may be within the projection field of the laser do not contain people.

Be sure the laser projector is safely and securely rigged.

Be sure you have at least one, but preferably two, reliable means of attenuating the laser beam such as an emergency stop, functioning DMX control, or the ability to quickly cut power to the projector.

Warm Up and Duty Cycle

From a "cold" start, it may take your X-Laser system as long as 15 minutes to reach full power. More commonly, warm-up time is less than 10 minutes. However, this time will be greatly increased if the unit is too hot or too cold. Excessive temperatures, especially cold, will reduce the laser power output by as much as 90% and may damage the laser. DO NOT LEAVE THIS FIXTURE IN A VEHICLE FOR LONG PERIODS OR IN DIRECT SUNLIGHT.

Once the laser reaches full power, the diodes may be turned off via DMX and then back on at a later time. If this is done within approximately thirty minutes, the laser will still project at full power. Avoid turning the projector on and off repeatedly in short intervals or leaving it on for more than three to four hours continuously. This fixture does not have a duty cycle and unlike most intelligent lighting systems with discharge lamps, the laser will perform a "hot re-strike," but it is not recommended as this may shorten the life of the laser.

Sound Active Mode

The unit responds to low frequency notes in music and runs through available laser patterns. Sensitivity to sound may be adjusted using the knob on the rear of the unit.

Access Sound Active Mode by setting all DIP switches to the DOWN/OFF position. Sound Active Mode is provided as a convenience for testing but is not recommended to be used during shows due to a loss of attenuation and X axis aiming control.

Auto Mode

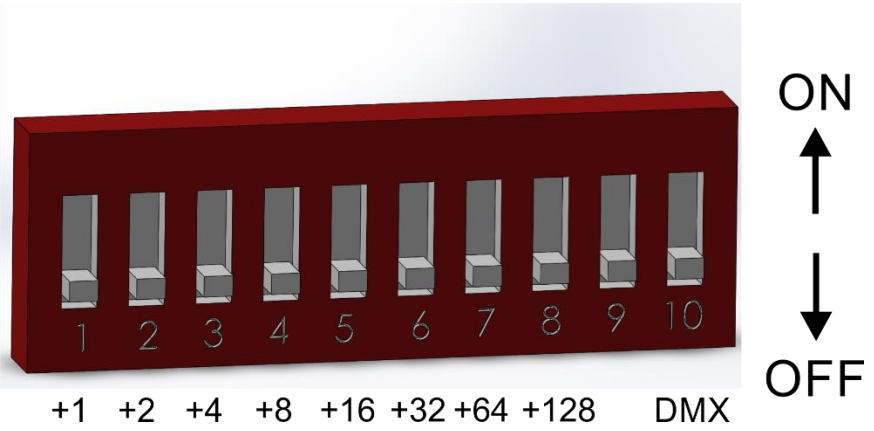
The unit replays all available laser sequences in order.

Access Auto Mode by pushing switch #1 UP/ON and leaving all other switches DOWN/OFF. Auto Mode is provided as a convenience for testing but is not recommended to be used during shows due to a loss of attenuation and X axis aiming control.

DMX Control

The unit responds only to DMX control inputs from an external DMX controller. SOUND ACTIVE and AUTO modes are also accessible via DMX Channel #1 on all fixtures.

Access DMX Mode by making sure that switches 9 & 10 are DOWN/OFF and use switches 1-8 to set the DMX address as show below.



Dip switches 9 and 10 are used for special functions and thus the laser is not DMX addressable above address 255. To reach a DMX address of 49 for example, turn switches 1, 5 & 6 to “On,” (1+16+32=49).

Your X-Laser product can be linked to other X-Laser fixtures or other DMX compatible fixtures. To create this link, it is recommended that true DMX cable be used for best operation and that the DMX chain be terminated at the end of the link. Please follow these steps:

1) From your DMX controller, connect a 3 pin DMX cable to the “DMX IN” port on the back of your X-Laser Product. For any additional fixtures, continue to daisy chain the DMX cable from the “DMX OUT” port on the

first fixture to the “DMX IN” port on the next fixture and so forth down the line. Your total length of DMX cable should not exceed 300 feet.

2) At the end of the DMX link, place a DMX terminator in the “DMX OUT” port of the last fixture in the link.

3) Use the dip switches (explained above) to set the DMX address of each fixture in the chain.

DMX Traits

Channel	Function	Value	Description
1	Mode	0-49 50-100 101-150 151-200 201-255	Laser OFF Auto Mode Sound Active Mode Static DMX Patterns Dynamic DMX Patterns
2	Pattern Selection	0-255	Static and Dynamic Patterns
3	Animation Speed	0-255	0 is slowest, 255 is fastest
4	Scan Rate	0-255	0 is fastest, 255 is slowest
5	X Axis Position	0-100 101-255	Move Left to Right Movement Presets
6	Static Pattern Size	0-1 2-63 64-95 96-127 128-159 160-255	Pattern Preset Small to Large with Steps Small to Large Animated Large to Small Animated Shrinking and Growing Animated Size Static at Last Position
7	Strobe	0-10 11-255	No Strobing Fast to Slow
8	Mirror	0-79 80-127 128-223 224-255	Large to Small with Steps Small to Large with Steps Shrinking and Growing Animated Size Static at Last Position
9	Color/Aperture Selection	0-255	Color/Aperture Selection Presets

Troubleshooting

Here are a few simple solutions to common difficulties to try out first to get you up and running quickly. If you are having any difficulty with your laser projector, please feel free to contact us online, any time, at support@x-laser.com

Problem	**Solutions**
Unit does not power on	Check if power cable is secure in the wall outlet and unit power inlet
	Check if the power switch is turned on and illuminated
	Check if the fuse is intact, if not replace with 250AC 2.5amp fuse
Replacement fuses continue to break	Try using a different IEC power cable of at least 16 gauge
	If problem persists contact X-Laser to return unit for service
Unit powers on, but has no output	Check manual for correct DIP switch settings
	Check for output in all modes (DIP switch settings)
	If in DMX mode check the DMX cable is securely attached both in the unit and your DMX controller, and make sure the unit is getting signal
No output in Manual DMX mode	If in DMX mode check the DMX cable is securely attached both in the unit and your DMX controller, and make sure the unit is getting signal
	Check that the DMX address is set the same on your DIP switches and your DMX controller

No output in Sound Active mode	Check manual for correct DIP-switch settings
	Check that the sensitivity knob is set to maximum
	Make sure laser is in close proximity to a speaker with moderate or higher bass
	Try lightly tapping the unit near the mic
	If problem persists contact X-Laser to return unit for service
No output in Auto Mode	Check manual for correct DIP switch settings
	If problem persists contact X-Laser to return unit for service

Repair and Return Information

Product Registration

Register Your Product: You must first register your X-Laser product at warranty.x-laser.net to activate your warranty. Failure to do so may result in loss of warranty service. ALWAYS KEEP YOUR PRODUCT BOX FOR SAFE RETURN PACKAGING.

Return Material Authorization (RMA) and Shipping

PLEASE NOTE: All returns will incur a $50 bench fee which will be waived if a) the product is repaired under warranty, b) the client elects to repair an out of warranty unit, or c) the unit is beyond repair and is disposed of with the client's authorization. The bench fee covers an initial evaluation, basic internal cleaning and basic alignment and calibration.

Please first contact X-Laser for an RMA number. Our support team will most likely spend a few minutes trying to diagnose the issue over the phone to find the fastest resolution for you. If the laser needs to be returned, you will be given an RMA number and a URL to complete the RMA process. All information you will need to return your laser is noted on the RMA web site. Upon completion of the online RMA form, a PDF with shipping instructions will appear.

Return shipping instructions will be located on the PDF form that pops up after you have completed and submitted the online RMA form. Follow shipping, packaging, and insurance instructions. X-Laser is not responsible for any shipping damages by shipper and/or poor client packaging.

Shipping within Continental USA

X-Laser pays return FedEx ground shipping to the customer for warranty and DOA repairs only. Out of warranty work shipping is paid by user in both directions. Faster shipping will incur an extra shipping fee.

Shipping outside Continental USA

X-Laser pays for FedEx return ground shipping to the customer or freight forwarder within continental USA for warranty or DOA repairs only. Out of warranty work shipping is paid by user in both directions. Shipping costs for parts, if approved by X-Laser, are paid by client. Faster shipping will incur an extra shipping fee.

Out of Warranty Repairs

X-Laser will evaluate the product and contact the user for repair authorization. Payment must be remitted by credit card or PayPal prior to service. Costs for repair are based on product model. Products not authorized for repair will be returned at user's expense. Following first request for repair authorization, a storage fee per month will be assessed. After sixty days product will be considered abandoned and disassembled.

General Notification

X-Laser at X-Laser's sole discretion reserves the right to:

- Change this policy without prior notification;
- Determine what is to be repaired and or replaced;
- Determine warranty status or repair and evaluation charges;
- Determine if a product has been misused, tampered, or damaged resulting in repair charges;
- Determine if user is to pay for return shipping;
- Determine charges for general maintenance and laser realignment.

Manufacturer's Limited Warranty

X-Laser warrants that this product will be free from defects of materials or workmanship for 12 months for the mechanical components of the laser system and 6 months for the laser diodes from the date of end-user purchase. This warranty will only apply to laser systems purchased from an authorized X-Laser dealer. This limited, non-transferable, warranty does not cover product abuse, exposure to the elements, accidental damage, shipping damage, improper usage, liquid or smoke damage (including fog juice), or units which have a broken factory seal, have been modified, rented, transferred to a third party, or are more than 12 months old.

Limitation of Liability

By using this product, the end user certifies that he/she is familiar with and agrees to practice all industry standard laser safety procedures and all such procedures contained herein. The purchaser of this product acknowledges that they have been advised that an FDA variance is required prior to use of any Class 3B or 4 laser system and the purchaser certifies that this product will only be operated by employees of the variance holder and in accordance with the terms of the variance. X-Laser specifically disclaims any liability arising from improper or unsafe usage of this product, usage without an active variance, or usage of this product in any manner other than intended. By using this product, the end user agrees to indemnify and hold harmless X-Laser LLC, its dealers and distributors, employees and staff, subsidiaries, and partners in any action arising from use of this product. Finally, the end user also agrees that prior to any use of this product, he/she shall have in effect a liability insurance policy with a sufficient per incident limit to cover any claims arising from the use of this product. Any purchaser who does not agree to these terms may return their unused X-Laser product within 7 days of purchase for a full and unconditional refund.

Return Policy

We want you to love using your X-Laser. If you don't love it, for whatever reason, please contact us so that we may help resolve whatever the issue may be. Factory sealed products may be returned to your dealer in accordance with their return policies. Used products may be returned for any reason within 14 days of purchase, assuming that they are in excellent condition, with a restocking fee of 15%. This fee is high in comparison to some other devices primarily because each returned unit has to be fully reconditioned and certified to be in compliance with FDA regulations before it can be resold to another client. This process is time consuming and costly, especially for just one unit at a time, and thus the restocking fee is required.

Questions? Feedback?

If you have any questions about any of the content of this manual or the safe operation of your new laser projector or would like to give us some feedback on our products or documentation, please do not hesitate to contact your dealer or X-Laser directly.

X-LASER USA

301-543-1981 Sales – Extension 0

866-702-7768 Support – Extension 155

General Information – Dial 0

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